

Attorney Docket No.: 00CON105P

**REMARKS**

By the present amendment, claims 1, 7, 11, and 19 have been amended. Thus, after the present amendment, claims 1-22 remain in the present application. Reconsideration and allowance of outstanding claims 1-22 in view of the above amendments and following remarks are requested.

**A. Rejections of Claims 1-22 under 35 USC §102(e)**

The Examiner has rejected claims 1-22 under 35 USC §102(e) as being anticipated by U.S. Patent Application Publication Number US 2002/0042909 A1 to Van Gageldonk, et al. ("Van Gageldonk"). For the reasons discussed below, Applicants respectfully submit that the present invention, as defined by amended independent claims 1, 7, 11, and 19, is patentably distinguishable over Van Gageldonk.

As disclosed in the present application, conventional approaches in the processor architecture field do not adequately address the problem of consumption of chip area for wide buses, such as wide "move" buses linking various register file banks. Various embodiments according to the present invention address and overcome the need in the art for speeding up the very long instruction word ("VLIW") processor architecture, reducing power consumption, and reducing chip area while accommodating multiple register file banks and multiple execution units.

Embodiments according to the present invention, as shown in Figure 2 of the present application, include first and second register file banks. The first register file

Attorney Docket No.: 00CON105P

bank comprises a first plurality of read ports, and the second register file bank comprises a second plurality of read ports. A first data path block comprises a first plurality of execution units, and a second data path block comprises a second plurality of execution units. A first plurality of buses couple the first plurality of read ports to each of the first and second data path blocks. A second plurality of buses couple the second plurality of read ports to each of the first and second data path blocks. An operand residing in the first plurality of read ports is concurrently accessed by the first plurality of execution units in the first data path block and by the second plurality of execution units in the second data path block.

In a conventional VLIW processor there are "move" buses that carry source operands from one register file bank to the other. This architecture consumes one or more additional clock cycles and accordingly reduces the operating speed of the conventional VLIW processor. Additionally, transfer of a source operand in this manner results in significant additional power consumption in the conventional VLIW processor since a "toggling" of potentially all of the bits (e.g. 64 bits) in a move bus might occur in order to complete the transfer of the source operand between register file banks. See, for example, present application at page 11, and Figure 1.

There are advantageously no move buses in the VLIW processor according to embodiments of the present invention, as explicitly set forth in the present application. See, for example, present application at page 14. In the present embodiments, due to the fact that operands are delivered directly from either register file bank to either data path

Attorney Docket No.: 00CON105P

block, the additional clock cycle required to move an operand from one register file bank to the other register file bank prior to the delivery of the operand to the destination data path block is eliminated. Since operands do not go through move buses 170 and 172 (Figure 1 of the present application), increased speed is achieved due to the elimination of the additional clock cycle existing in a conventional VLIW processor. Moreover, the charging and discharging of these buses for the purpose of accomplishing a move is avoided, and as such, a substantial power savings is achieved.

Thus, by replacing move buses 170 and 172 (Figure 1 of the present application) in a conventional VLIW processor with read buses 260, 262, 264, and 266 in VLIW processor 200 (Figure 2 of the present application), embodiments of the invention achieve increased speed and reduced power without increasing the required chip area. Applicants have amended independent claims 1, 7, 11, and 19 to indicate that there are no move buses in the VLIW processor according to the present invention.

In contrast, Van Gageldonk is directed to a retargetable compiling system and method. Van Gageldonk generates a sequence of program instructions for use in a processing architecture with architecture resources executing instructions from a corresponding instruction set. A retargetable compiler is implemented to generate a code using at least two instruction sets in the same processing architecture. Van Gageldonk does not disclose, teach, or suggest the VLIW processor of the present embodiment. Van Gageldonk does not disclose, teach, or suggest a VLIW processor that does not include or utilize "move buses," as claimed in amended independent claims 1, 7, 11, and 19.

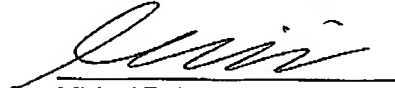
Attorney Docket No.: 00CON105P

For the foregoing reasons, Applicants respectfully submit that the present invention as defined by amended independent claims 1, 7, 11, and 19 is not taught, disclosed, or suggested by the art of record. Thus, amended independent claims 1, 7, 11, and 19 are patentably distinguishable over the art of record. As such, the claims depending from amended independent claims 1, 7, 11, and 19 are, *a fortiori*, also patentable for at least the reasons presented above and also for additional limitations contained in each dependent claim.

**B. Conclusion**

Based on the foregoing reasons, the present invention, as defined by amended independent claims 1, 7, 11, and 19, and the claims depending therefrom, is patentably distinguishable over the art cited by the Examiner. Thus, outstanding claims 1-22 are patentably distinguishable over the art cited by the Examiner. As such, and for all the foregoing reasons, an early Notice of Allowance directed to all claims 1-22 remaining in the present application is respectfully requested.

Attorney Docket No.: 00CON105P

Respectfully Submitted,  
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